

FIRST AUXILIARY REQUEST

Claims

1. A refrigerant composition which comprises:

(i) pentafluoroethane, 1,1,1,2- ~~or 1,1,2,2-tetrafluoroethane, 1,1-difluoroethane, trifluoromethoxypentafluoroethane, 1,1,1,2,3,3,3-heptafluoropropane or 1,1,1,2,2,3,3-heptafluoropropane~~, or a mixture of two or more thereof, in an amount from 30 to 50% by weight based on the weight of the composition
 (ii) an unsubstituted hydrocarbon of the formula C_nH_m in which n is at least 4 and m is at least $2n-2$, other than methyl propane, in an amount from 1 to 4% by weight based on the weight of the composition.

with the remainder, not exceeding 60% by weight based on the weight of the composition, being:

(iii) pentafluoroethane, ~~trifluoromethoxydifluoromethane or hexafluorocyclopropane, or a mixture of two or more thereof.~~

2. A composition according to claim 1 wherein component (i) is present in an amount of 50% by weight based on the weight of the composition.

3. A composition according to claim 1 or 2 wherein component (i) is 1,1,1,2-tetrafluoroethane or a mixture of said ethane with pentafluoroethane.

4. A refrigerant composition which comprises:

(i) pentafluoroethane, 1,1,1,2- ~~or 1,1,2,2-tetrafluoroethane, 1,1-difluoroethane, trifluoromethoxypentafluoroethane, 1,1,1,2,3,3,3-heptafluoropropane or 1,1,1,2,2,3,3-heptafluoropropane~~, or a mixture of two or more thereof, in an amount from 50 to 75% by weight based on the weight of the composition
 (ii) an unsubstituted hydrocarbon of the formula C_nH_m in which n is at least 4 and m is at least $2n-2$, other than methyl propane, in an amount from 1 to 4% by weight based on the weight of the composition; with the remainder being
 (iii) pentafluoroethane, ~~trifluoromethoxydifluoromethane or hexafluorocyclopropane, or a mixture of two or more thereof.~~

5. A composition according to claim 4 wherein component (i) is 1,1,1,2-tetrafluoroethane or a mixture of said ethane with pentafluoroethane.

- ~~6. A composition according to claim 4 or 5 wherein component (iii) is pentafluoroethane.~~

- ~~7. A refrigerant composition which comprises:~~

~~(i) 1,1,1,2- or 1,1,2,2-tetrafluoroethane, or a mixture of pentafluoroethane and 1,1,1,2- or 1,1,2,2-tetrafluoroethane, in an amount from 30 to 94% by weight based on the weight of the composition,
 (ii) an unsubstituted hydrocarbon of the formula C_nH_m in which n is at least 4 and m is at least $2n-2$, other than methyl propane, in an amount from 1 to 4% by weight based on the weight of the composition,
 (iii) pentafluoroethane in an amount from 5 to 60% by weight based on the weight of the composition with the proviso that the concentration of pentafluoroethane in the composition is not 5 to 20% by weight based on~~

the weight of the composition.

- 6.8. A composition according to any one of the preceding claims wherein component (ii) is present in an amount from 2 to 4% by weight based on the weight of the composition.
- 5 7.9. A composition according to claim ⁶ wherein component (ii) is present in an amount from 3 to 4% by weight based on the weight of the composition.
- 8.10. A composition according to any one of the preceding claims wherein component (ii) is a mixture of said hydrocarbons.
- 10 ~~11. A composition according to any one of the preceding claims wherein component (ii) comprises a hydrocarbon which possesses 4 or 5 carbon atoms.~~
- 15 12. A composition according to ^{any of the preceding claims} claim ~~11~~ wherein component (ii) comprises a hydrocarbon which is n-butane.
- 10 13. A composition according to claim ⁹ 12 which comprises:
- 20 (a) 46 to 46.5% by weight of pentafluoroethane
(b) 50 % by weight of 1,1,1,2-tetrafluoroethane and
(c) 4 to 3.5% by weight, respectively, of n-butane.
- 11 14. Use as a refrigerant of a composition as claimed in any one of claims 1 to ¹⁰ 13.
- 25 15. Use according to claim ¹¹ 14 in a refrigeration or airconditioning system designed to use chlorodifluoromethane as refrigerant.
- ~~16. Use of a refrigeration composition which comprises:~~
- 30 ~~(i) pentafluoroethane, 1,1,1,2- or 1,1,2,2-tetrafluoroethane, 1,1-difluoroethane, 1,1,1,2,3,3,3-heptafluoropropane or 1,1,1,2,2,3,3-heptafluoropropane, or a mixture of two or more thereof, in an amount from 30 to 94% by weight based on the weight of the composition and~~
- 35 ~~(ii) an unsubstituted hydrocarbon of the formula C_nH_m in which n is at least 4 and m is at least 2n-2, other than methyl propane, in an amount from 1 to 10% by weight based on the weight of the composition, as a replacement for chlorodifluoromethane.~~
- ~~(iii) pentafluoroethane in an amount from 5 to 60% by weight based on the weight of the composition, as a replacement for chlorodifluoromethane.~~
- 40 ~~17. Use according to claim 16 wherein the composition is as defined in claim 13.~~
- 13 18. The process for producing refrigeration which comprises evaporating a composition as claimed in any one of claims 1 to ¹⁰ 13 in the vicinity of a body to be cooled.
- 14 19. A refrigeration apparatus containing, as refrigerant, a composition as claimed in any one of claims 1 to ¹⁰ 13.
- 45 15 20. A refrigeration apparatus according to claim ¹⁴ 19 which is designed to use chlorodifluoromethane as refrigerant.

FIRST AUXILIARY REQUEST

Claims

- 5 1. A refrigerant composition which comprises:
- (i) pentafluoroethane, 1,1,1,2-tetrafluoroethane, or a mixture thereof, in an amount from 30 to 50% by weight based on the weight of the composition,
- (ii) an unsubstituted hydrocarbon of the formula C_nH_m in which n is 4 or 5 and m is at least $2n-2$, other than methyl propane, in an amount from 1 to 4% by weight based
- 10 on the weight of the composition,
- with the remainder, not exceeding 60% by weight based on the weight of the composition, being:
- (iii) pentafluoroethane.
- 15 2. A composition according to claim 1 wherein component (i) is present in an amount of 50% by weight based on the weight of the composition.
3. A composition according to claim 1 or 2 wherein component (i) is 1,1,1,2-tetrafluoroethane or a mixture of said ethane with pentafluoroethane.
- 20 4. A refrigerant composition which comprises:
- (i) pentafluoroethane, 1,1,1,2-tetrafluoroethane, or a mixture thereof, in an amount from 50 to 75% by weight based on the weight of the composition,
- (ii) an unsubstituted hydrocarbon of the formula C_nH_m in which n is 4 or 5 and m is at least $2n-2$, other than methyl propane, in an amount from 1 to 4% by weight based
- 25 on the weight of the composition,
- with the remainder being:
- (iii) pentafluorethane.
- 30 5. A composition according to claim 4 wherein component (i) is 1,1,1,2-tetrafluoroethane or

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a mixture of said ethane with pentafluoroethane.

6. A composition according to any one of the preceding claims wherein component (ii) is present in an amount from 2 to 4% by weight based on the weight of the composition.

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7. A composition according to claim 6 wherein component (ii) is present in an amount from 3 to 4% by weight based on the weight of the composition.

8. A composition according to any one of the preceding claims wherein component (ii) is a mixture of said hydrocarbons.

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9. A composition according to any of the preceding claims wherein component (ii) comprises a hydrocarbon which is n-butane.

15 10. A composition according to claim 9 which comprises:

- (a) 46 to 46.5% by weight of pentafluoroethane,
- (b) 50% by weight of 1,1,1,2-tetrafluoroethane and
- (c) 4 to 3.5% by weight, respectively, of n-butane.

20 11. Use as a refrigerant of a composition as claimed in any one of claims 1 to 10.

12. Use according to claim 11 in a refrigeration or airconditioning system designed to use chlorodifluoromethane as refrigerant.

25 13. The process for producing refrigeration which comprises evaporating a composition as claimed in any one of claims 1 to 10 in the vicinity of a body to be cooled.

14. A refrigeration apparatus containing, as refrigerant, a composition as claimed in any one of claims 1 to 10.

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15. A refrigeration apparatus according to claim 14 which is designed to use chlorodifluoromethane as refrigerant.